Test Summary

On July 31, 2015, a heavy-duty in-use test was successfully performed on this vehicle for gaseous and particulate matter emissions. There were 58 gaseous and 29 particulate matter NTE events, with a net of 48 gaseous and 24 particulate matter NTE events after exclusions due to cold temperature operation. The vehicle pass ratio exceeded minimum requirements of 0.90; therefore, this vehicle passes the VPR test.

Test Information

Test Date	7/31/15
Location	Dayton, OH
Vehicle Owner	Dayton Corrugated Packaging Corporation
Type / Descr	US DOT 583169
Make	Navistar
Model	Engine: A410 Truck: 8600 XBA 6x4 Transmission: AMT
Model Year	2013
License Plate	PVZ5729 OHIO
VIN	1HSHXSNR1EH787770
Engine Family	DNVXH07570SB
Engine SN	126MH2Y4301424
Starting Odometer	75118 miles
Ending Odometer	75379 miles

Participants

Name	Affiliation / Title
Chris Darby	Sensors Inc/Senior Applications Engineer
Vio Filip	Sensors Inc/ Lead Field Engineer
Holly Haig-Ramage	Sensors Inc/ Field Engineer
Frank Fazzalari	Navistar/ Engineer
Kisime	Operator /Driver

Equipment Used

Component	SN	Verified 1065 Compliant	Expiration Date	Initials
SEMTECH-ES Modules				
FEM	E12101583	YES	08/25/15	AM
NOx	H13110053	YES	08/25/15	AM
FID	J13111270	YES	08/25/15	AM
MPS	C13107048	YES	08/25/15	AM
CQCM Asset 1015	PMS00001	YES	08/25/15	BE
HTF	H12103085	YES	10/22/15	CE
FID Fuel bottle LOT 0211RC14	CK1035260	YES	02/11/16	TS
Weather Probe RH Sensor Probe 1542	I141184318	YES	09/30/16	AM
GPS	1A4125500	-	-	JE
VI	47600BR	-	-	JE
TSI Flow Reference	4122211421002	YES	04/01/16	DM

Calibration Gases Used

Bottle	SN	Listed Concentrations	Expiration Date	Initials
Quad Span Cylinder: CO2, CO, NO, Propane LOT_0411WC15	EA0006412	15 %, 1200 ppm, 1000 ppm, 250 ppm (NI CD15X3ZN-RA3)	04/11/17	TS
NO2 Span Cylinder LOT _ 1112HF13	EA0004880	250 ppm	10/30/15	TS
Zero Nitrogen Cylinder LOT_0219RC14	FF49276	100% N2	02/19/16	TS

Test Records

No.	Data File Name	Start Time	Duration (seconds)	Comment
1	NAV4_7770_073115.csv	06:45:21	20706 none 31796	Non-idle DPF Regeneration total test time
2				
3				
4				

Additional Comments:

Gaseous Emission Results

Calculation of In-use Emission Test Limits

The following table shows the input data and resulting calculated NTE Threshold for the HDIU compliance program for the vehicle tested. For MY2012 and later vehicles, the compliance margin for kNOx and PM have been reduced to a value of zero g/bhp-hr:

	FEL	Standard NTE multiplier	Compliance Margin	Accuracy Margin	NTE Threshold g/bhp-hr
CO	15.5	1.25	0.00	0.25	**19.7**
kNOx	0.20	1.5	0.00	0.15	**0.45**
NMHC	0.14	1.5	0.00	0.01	**0.22**
PM	0.01	1.5	0.00	0.01	**0.03**

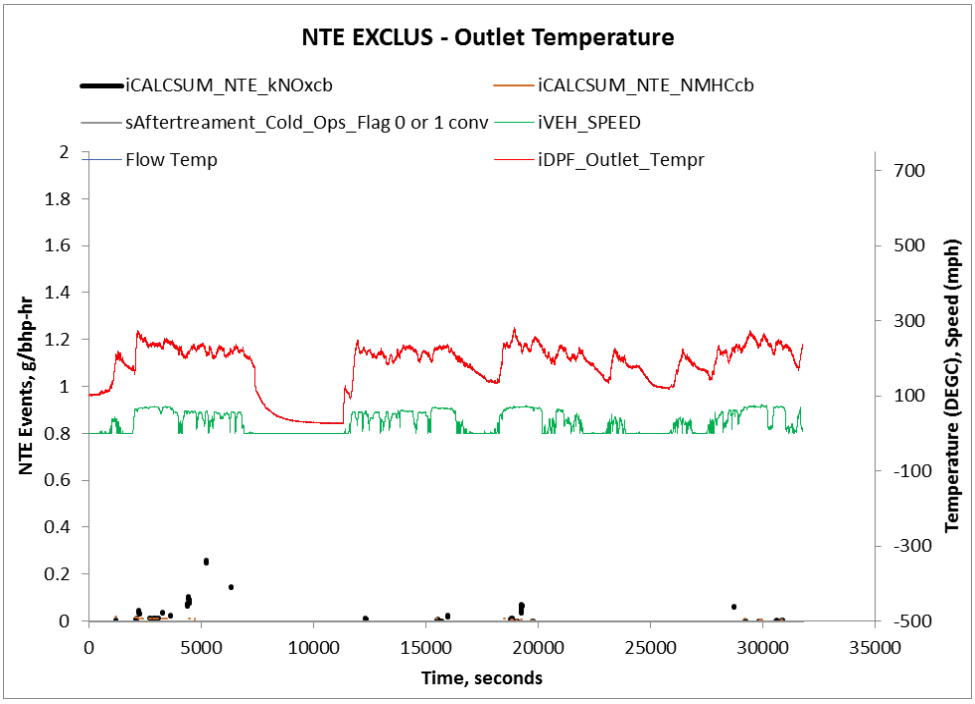
A. Test Results without exclusions

Processed filename: pp_NAV4_7770_073115 No Exclusions.csv

	# valid NTE Events	# NTE events passing drift	Average g/bhp-hr	Max g/bhp-hr	Vehicle Pass Ratio > 0.9 required
CO2	58	58	569.1	608.2	**N/A**
CO	58	58	0.1	0.4	**1.00**
kNOx	58	58	0.03	0.31	**1.00**
NMHC	58	58	0.01	0.01	**1.00**
PM	29	29	0.00	0.01	**1.00**

The preceding table shows the average and maximum NTE emissions measured for each pollutant, prior to any applicable exclusions. In this test, there were 58 gaseous NTE events and 29 particulate matter NTE results. Note that the vehicle pass ratio exceeds the required 0.9 level, indicating that this vehicle would pass if all these NTEs were included in the EPA report. In the next section, we will examine exclusions under EPA rules § 86.1370–2007 due to cold-engine temperature operation with EGR (see section B below).

The graph below illustrates the vehicle emissions prior to exclusions.

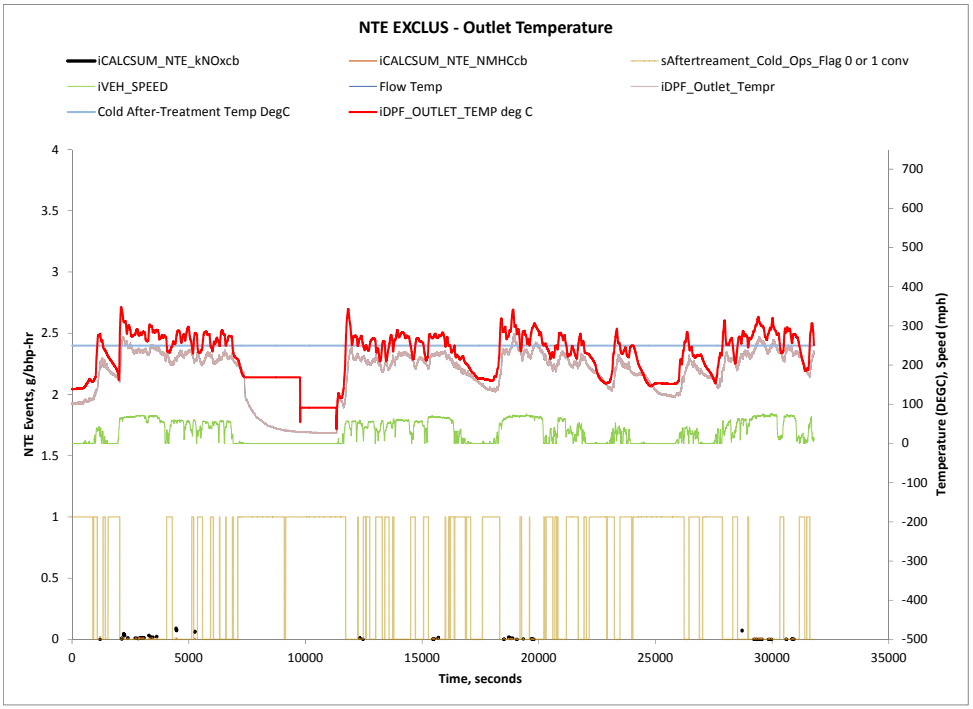


B. Test results with all applicable exclusions
Processed filename: pp_NAV4_7770_EXCLUS.csv

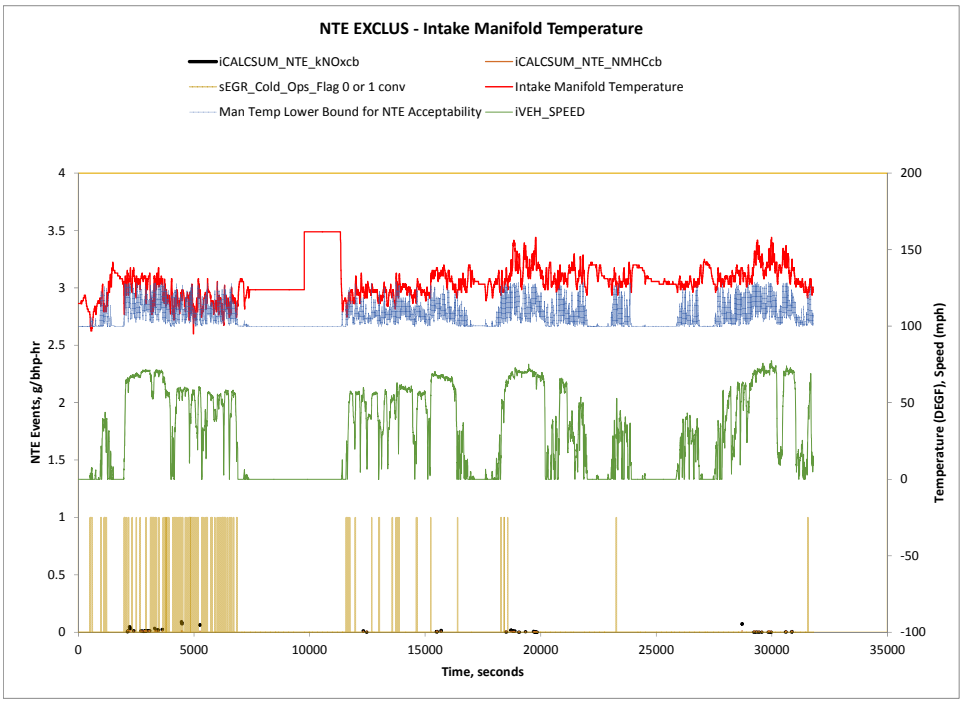
	# valid NTE Events	# NTE events passing drift	Average g/bhp-hr	Max g/bhp-hr	Vehicle Pass Ratio > 0.9 required
CO2	48	48	571.8	608.2	**N/A**
CO	48	48	0.1	0.5	**1.00**
kNOx	48	48	0.01	0.08	**1.00**
NMHC	48	48	0.01	0.01	**1.00**
PM	24	24	0.00	0.01	**1.00**

The preceding table shows the NTE emissions results and vehicle pass ratio after all exclusions were applied. These are the results that are reportable to EPA. There were a net of 48 gaseous and 24 particulate matter NTE events after exclusions due to cold temperature operation. The vehicle pass ratio exceeded minimum requirements of 0.90; therefore, this vehicle passes the VPR test.

The graph below summarizes the impact of cold after-treatment temperature on NTE exclusions:



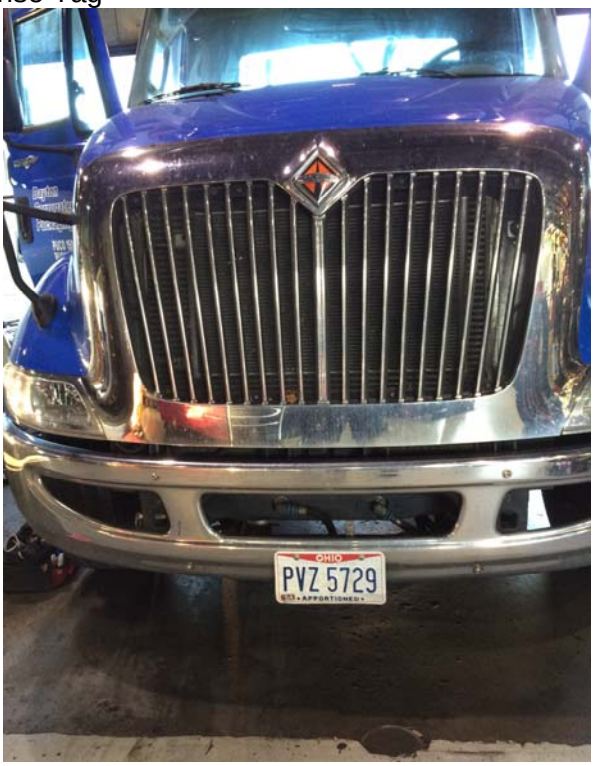
The graph below illustrates the cold-engine exclusion for intake manifold temperature.



Installation Pictures

Test Vehicle

License Tag



Engine Tag

Exhaust Flow Meter

Analyzer Stack – Gaseous

Analyzer Stack – Particulate Matter